

REMARKS

This amendment is in response to the Office Action mailed June 14, 2007.

Claim 4 has been amended. Claims 9-16 have been canceled.

Applicants wish to thank the Examiner for recognizing in paragraph 9 of the Office Action that claims 3 and 8 are allowable if rewritten in independent form. Applicants respectfully defer rewriting these claims in independent form until final resolution of the rejected claims.

In paragraph 2 of the Office Action, the drawings are objected to under 37 C.F.R. § 1.83(a) for failing to show the features specified in claims 10, 12, 14 and 16. As claims 10, 12, 14 and 16 have been canceled, Applicants respectfully request withdrawal of this objection.

In paragraphs 3 and 4 of the Office Action, claims 4-6, 10 and 12-16 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claim 4 has been amended to correct the wording describing the location of each of the eight elements on the claimed rectangular substrate. For example, the first element is "at a position closer to the left side than the right side and below a first center line of the left side and the right side, the first center line being perpendicular to the Y-axis" One embodiment is element (61), illustrated on Figure 42, and thus is not new matter. Claims 5 and 6 depend from claim 4. Claims 10, 12 and 13-16 have been canceled. With this amendment, Applicants respectfully request withdrawal of this rejection.

In paragraphs 5 and 6 of the Office Action, claims 9, 11, 13 and 15 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the

invention. Applicants have canceled claims 9, 11, 13 and 15, in light of the fact that the Office Action admits that “a rectangular shape is generally square,” and that it is understood that the claimed invention of the remaining claims cover rectangular substrates, including those that are generally square.

In paragraphs 7 and 8 of the Office Action, claims 2 and 7 are rejected under 35 U.S.C. § 102(e) as being anticipated by International Publication No. WO 00/79298 to Adelerhof et al. (Adelerhof). The Examiner’s rejection on this ground is respectfully traversed.

As understood by the Applicants, the Office Action asserts on page 11 that “it appears that the entire Figure 11 represents an embodiment of the sensing system that allows for a full 360 degree angle embodiment in a matrix configuration.” Applicants disagree, noting that Figure 11 shows a 3x4 matrix of compact double Wheatstone bridges, each of which is a sensor that is a full 360 degree angle embodiment of a sensing system illustrated in Figure 10. The Office Action admits that “Figure 10 shows a compact double GMR-based Wheatstone bridge for a full 360 degrees angle sensing system ...,” and Applicants agree with this statement. It is clear for the person having an ordinary skill in the art to interpret that Figure 11 shows a wafer to produce 12 of the sensors disclosed in Figure 10. The dotted lines in Figure 11 illustrate how the wafer should be cut into the 12 sensors.

In claim 2, Applicants are claiming “a magnetic sensor comprising . . . a plurality of said magnetoresistance effect elements . . . placed symmetrically with respect to center lines of the rectangular shape.” Applicants are not claiming 12 different sensors. Unlike claim 2, Fig. 11 discloses 12 different sensors. As far as Applicants understand the disclosure of Adelerhof, which provides only a brief description for Fig. 11, each sensor in the 3 X 4 matrix is “a compact double Wheatstone

bridge[] for a full 360 degree angle embodiment of the sensing system.” Adelerhof, p. 13. In order to form a sensor, the elements must be connected together in, *e.g.*, a Wheatstone bridge. Applicants respectfully request that the Examiner identify the claimed “magnetoresistance effect elements ...” illustrated in Fig. 11, that are “placed symmetrically with respect to center lines of the rectangular shape,” where Adelerhof discloses the pinned magnetization directions of the pinned layers of those elements in Fig. 11 to show that “at least two of said plurality of magnetoresistance effect elements have the pinned magnetization directions that cross each other,” and how Adelerhof indicates such element should be electrically connected to form the single magnetic sensor claimed in claim 2. Without disclosure of each and every element of the claim, the cited reference Adelerhof cannot anticipate.

Should the Examiner choose to cite Adelerhof Figure 10, it clearly is different from claim 2, since the system in Figure 10 is not symmetrical with respect to a center line along an X-axis. In the absence of any disclosure or suggestion of these features of the invention, claim 2 is believed to be in condition for allowance.

With respect to amended claim 4, the same arguments for claim 2 apply. Adelerhof Fig. 11 discloses 12 magnetic sensors, each comprising compact double GMR-based Wheatstone bridges. Referring to the marked up Fig. 11 from Adelerhof, provided in a previous Office Action, 8 different double Wheatstone bridges are identified, each from a different sensor of the 3×4 matrix. Fig. 11 lacks any disclosure that the elements identified by the Examiner should be electrically connected to form a single magnetic sensor and what the pinned magnetization direction of the elements in each bridge are.

Furthermore, with reference to the marked-up Fig. 11, the prior Final Office Action states that, “the bridges that (8) and (7) are a part of are inverted to that which is

shown in Figure 10. In this bridge, given the magnetization direction of disclosed in Figure 10, the magnetization direction of the top middle elements would be opposite to that shown in Figure 10.” Applicants respectfully disagree with this assertion. There is no disclosure whatsoever in Adelerhof at all concerning the pinned magnetization direction of any of the 96 (8x3x4) elements in the 24 (3x4x2) Wheatstone bridges of the 12 sensors illustrated in Fig. 11. Should the Examiner wish to maintain this rejection, Applicants respectfully request that the Examiner identify where Adelerhof discloses the pinned magnetization direction for each element that the Examiner maintains represents each of the claimed elements in claim 4, so that a determination can be made whether Adelerhof discloses all of the claimed elements. In the absence of any disclosure of the claimed elements, claim 4 is believed to be in condition for allowance.

With respect to claim 7, the same arguments for claim 2 apply. Amended claim 7 recites, “(b) an X-axis group of four of a plurality of said magnetoresistance effect elements constructs an X-axis magnetic sensor for detecting a magnetic field in an X-axis direction and all of said magnetoresistance effect elements of the X-axis group have pinned magnetization directions of the pinned layers parallel to each other.” Which elements of the 96 elements disclosed in Fig. 11 are the “four of the elements whose pinned direction is in along the X-axis in Figure 11,” as the Office Action asserts? As stated above, Adelerhof does not disclose or suggest these features, because it does not indicate pinned directions in Fig. 11, and only illustrates double compact Wheatstone bridges, not individual elements. In the absence of any disclosure of the claimed elements, claim 7 is believed to be in condition for allowance.

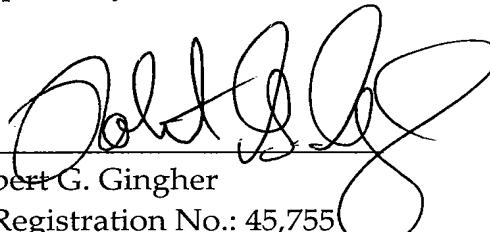
Claims 3, 5 and 6 depend from claims 2 and 4, and all of the limitations found therein. These claims include further limitation which, in combination with the limitations of claim 2 and 4, are neither disclosed nor suggested in the art of record. By way of example, Figure 10 and 11 of Adelerhof do not disclose or suggest the recited

feature in amended claim 5 of "an X-axis magnetic sensor for detecting a magnetic field in the direction of the X-axis by full bridge connection of the first to fourth elements" and "a Y-axis magnetic sensor for detecting a magnetic field in the direction of the Y-axis by full bridge connection of the fifth to eighth elements." As stated earlier, there is no disclosure in Adelerhof that the cited devices shown in Figure 11 are connected by electrical lines which cross the dotted lines in Figure 11.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application issue.

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Respectfully submitted,

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